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The effectiveness of wound care education on wound healing in post caesarean section mothers

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Abstract

Background: Caesarean section (CS) is a common surgical procedure associated with postoperative wound complications if wound care is not optimally managed. Patient education plays a crucial role in improving mothers' knowledge and supporting postoperative wound management,

Purpose: This study aimed to analyze the effectiveness of wound care education on knowledge level and wound healing outcomes among post-caesarean section mothers,

Method: A quasi-experimental study with a non-equivalent control group pretest–posttest design was conducted. Thirty post-CS mothers were recruited using purposive sampling and divided into intervention and control groups. The intervention group received structured wound care education through leaflets and counseling, while the control group received standard education. Data were collected using a knowledge questionnaire and wound assessment (REEDA score). Data analysis was performed using the Wilcoxon Signed Rank Test,

Results: The results showed a significant improvement in knowledge levels among mothers in the intervention group after receiving wound care education. However, no significant difference in wound healing outcomes was found between the intervention and control groups at the posttest, as all participants demonstrated good wound healing conditions,

Conclusion: Wound care education effectively improves knowledge among post-caesarean section mothers but does not significantly affect short-term wound healing outcomes. Integrating structured wound care education into routine nursing care is recommended to support self-care and prevent postoperative complications.

Keywords: Caesarean Section; Maternal Knowledge; Nursing Education; Wound Care; Wound Healing.

INTRODUCTION

Caesarean section (CS) is one of the most frequently performed surgical procedures in obstetric services. In recent years, the rate of deliveries by CS has continued to increase, both globally and nationally. This increase demands special attention to post-operative care, especially wound care, because surgical wounds are one source of complications that can affect the safety and quality of life of mothers

(Gillespie, Thalib, Harbeck, Tobiano, Kang, Tobiano, & Chaboyer, 2023).

Post-caesarean surgical wounds are at risk of complications such as surgical site infection (SSI), hematoma, and wound dehiscence if not optimally managed. These complications can prolong recovery time, increase maternal morbidity rates, and add to the burden of healthcare costs (Bossert, Vey, Piskorski,

Fleischhauer, Awounvo, Szecsenyi, & Senft, 2023). Research in Indonesia shows that the incidence of caesarean section wound infections is still found in postpartum mothers, especially those who have low knowledge about wound care (Andriani, Sembiring, Napitupulu, Suherni, & Elnia, 2024).

Post-caesarean wound care does not only depend on the medical actions provided during hospital treatment but is also highly influenced by the wound care behaviors performed by the mother after returning home. The lack of mother's knowledge about wound care, signs of infection, and principles of wound hygiene can increase the risk of post-operative complications (Sulistyaningrum, Prajayanti, Prastiwi, & Maurytani, 2025). Therefore, wound care education is an important part of post-caesarean nursing care.

Wound care education provided by nurses aims to increase the mother's understanding of how to care for the wound correctly, increase independence in self-care, and encourage early detection of signs of complications. Research shows that structured health education can increase patients' knowledge and skills in performing post-operative wound care (Gillespie, Walker, Lin, Roberts, Eskes, Nieuwenhoven, & Chaboyer, 2023). In addition, post-operative education has also been proven to increase patient readiness in undergoing independent care after returning home from the hospital (Gillespie et al., 2023).

Although wound care education has been proven to increase patient knowledge, research results related to the direct effect of education on wound healing show varied findings. Wound healing is a complex process influenced by various factors, such as early mobilization, nutritional status, surgical technique, and standard clinical care (Bossert et al., 2023; Zarei, Rostami, Bozorghnejad, Ardebili, Mamashli, Eliasi, & Khachian, 2020). Several national studies also show that early mobilization is associated with the post-caesarean wound healing process, indicating that education needs to be combined with other nursing interventions (Armayanti, Nataningrat, & Tangkas, 2024; Ulandari, Azizah, & Wulandari, 2022; Djafar, Naziyah, Wowor, & Dwi, 2022).

Apart from education and mobilization factors, the use of appropriate wound care methods, such as the

selection of suitable wound dressings, also contributes to the success of post caesarean section wound healing (Alviana & Imamah, 2025). This indicates that wound healing cannot be influenced by just one factor but is rather the result of the interaction of various aspects of care.

RESEARCH METHOD

The type of research is quasi-experimental with a non-equivalent control group pretest-posttest design. This design is used to evaluate the effectiveness of wound care education on the acceleration of wound healing, by comparing the results between the intervention group and the control group before and after treatment. All post-caesarean section (CS) mothers undergoing treatment at the hospital which was the research location. Post-caesarean section mothers on day 1 to day 2 post-operation, who met the inclusion criteria. Inclusion criteria were post CS mothers who were willing to be respondents and signed informed consent, aged 20-40 years, could read and write, did not experience severe complications (e.g., sepsis, blood clotting disorders, uncontrolled diabetes), gave birth by elective CS or non-emergency medical indication. The sampling technique used purposive sampling and the total sample was 30 people.

In this study, the data collection methods used were observation and interviews. These techniques were used to obtain data and information as well as to complement the measurement of knowledge and REEDA score (baseline) in both groups. The provision of education was carried out in the intervention group through leaflets, accompanied by counseling sessions conducted on day 1 after CS. Follow-up education was conducted on days 3 and 7. The control group received standard education (special leaflet). Monitoring and evaluation were then carried out, namely the REEDA assessment was carried out on days 3, 7, and 14 post-operation, and knowledge was re-measured on days 7 and 14.

Furthermore, the data was processed and analyzed univariately and bivariately. Univariate data included a description of respondent characteristics, mean knowledge scores, and REEDA scores. Bivariate data used the paired t-test or Wilcoxon signed-rank test for

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differences before and after within each group, and the independent t-test or Mann-Whitney test for comparisons between groups. Multivariate data

analysis (optional) used logistic regression test to identify factors affecting wound healing.

RESEARCH RESULTS

Table 1. Distribution of Knowledge Levels among Post-Caesarean Section Mothers (N=15)

Group	Measurement Time	Good Knowledge n (%)	Poor knowledge n (%)
Intervention	Pretest	8 (53.3)	7 (46.7)
Intervention	Posttest	15 (100)	0 (0)
Control	Pretest	4 (26.7)	11 (73.3)
Control	Posttest	15 (100)	0 (0)

Table 1 shows that in the intervention group, prior to wound care education, more than half of the respondents had good knowledge (53.3%), while 46.7% had fair knowledge. After receiving wound care education, all respondents (100%) demonstrated good knowledge. In the control group, most respondents had fair knowledge at pretest (73.3%). However, at posttest, all respondents (100%) achieved good knowledge.

Table 2. Distribution of Wound Healing Conditions (N=15)

Group	Measurement Time	Good/Adequate Wound Healing n (%)
Intervention	Pretest	15 (100)
Intervention	Posttest	15 (100)
Control	Pretest	15 (100)
Control	Posttest	15 (100)

As shown in Table 2, all respondents in both the intervention and control groups were categorized as having good or adequate wound healing at both pretest and posttest measurements.

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Table 3. Descriptive Statistics of Knowledge and Wound Condition

Variable	Group	Mean	SD	Minimum	Maximum
Knowledge Pretest	Intervention	1.47	0.52	1	2
Knowledge Posttest	Intervention	1.00	0.00	1	1
Knowledge Pretest	Control	1.73	0.46	1	2
Knowledge Posttest	Control	1.00	0.00	1	1
Wound Condition Pretest	Intervention	1.00	0.00	1	1
Wound Condition Posttest	Intervention	1.00	0.00	1	1
Wound Condition Pretest	Control	1.00	0.00	1	1

Table 3 indicates a decrease in the mean knowledge score from pretest to posttest in the intervention group, reflecting an improvement in knowledge category. A similar pattern was observed in the control group. The wound condition scores remained homogeneous across all measurements.

Table 4. Wilcoxon Signed Rank Test Results

Comparison	Z	p-value
Knowledge Pretest vs Wound Condition Pretest (Intervention)	-2.646	0.008*
Knowledge Posttest vs Wound Condition Posttest (Intervention)	0.000	1.000
Knowledge Pretest vs Wound Condition Pretest (Control)	-3.317	0.001*
Knowledge Posttest vs Wound Condition Posttest (Control)	0.000	1.000

Table 4 demonstrates significant differences between knowledge and wound condition at the pretest phase in both intervention and control groups ($p < 0.05$). However, no significant differences were found at the posttest phase, as all respondents exhibited uniform knowledge levels and wound healing condition.

DISCUSSION

This study aims to analyze the effectiveness of wound care education on the knowledge level and wound healing condition of post caesarean section (CS) mothers. The results of the study show that providing wound care education is able to significantly increase the mother's knowledge level in the treatment group. This finding strengthens the role of education as an essential nursing intervention in post-operative care, especially for post caesarean section mothers.

This study shows that wound care education significantly increases the knowledge level of post caesarean section mothers in the intervention group. Structured education helps mothers understand the

importance of wound hygiene, recognize signs of complications such as infection, and increase their readiness to perform independent wound care after returning home from the hospital. This finding is in line with national research on post-operative health management education which reports that systematic educational intervention can increase the knowledge level of post-CS patients so they can carry out self-care better and prevent complications (Saputri & Ambarika, 2025).

Effective education is expected to increase patient independence and support the success of wound healing in the long term. The results of the study show

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that wound care education has a significant effect on increasing the knowledge of post caesarean section mothers. In the treatment group, there was a very clear increase in knowledge from pretest to posttest. Before being given education, 53.3% of respondents were in the good knowledge category and 46.7% in the sufficient category. After being given education, all respondents (100%) were in the good knowledge category. This proves that education is effective in increasing mothers' understanding and readiness to perform independent wound care, in line with previous research which showed that health education plays a large role in increasing understanding and changes in wound care behavior (Elsayed, Elsayed Ahmed, Mohamed, & Mohamed, 2021).

In the group without treatment, an increase in knowledge also occurred, although not through specific education. This can be influenced by routine health worker education, interaction between patients, or personal experience. However, this increase was not as large as in the treatment group which received structured education, so the effectiveness of the education remained clearly visible.

The increase in knowledge that occurred after the provision of education was in line with previous research findings which stated that structured wound care education guidelines can increase mothers' knowledge, confidence, and practice in caring for caesarean section surgical wounds. Education provides a better understanding for mothers about how to maintain wound hygiene, recognize signs of infection, and the importance of adherence to care recommendations during the recovery period (Ali, Qasem, & Ahmed, 2023).

These results are also supported by international research showing that discharge education or post-operative education provided by health workers, especially nurses, contributes to patients' understanding of surgical wound care so as to strengthen self-management capabilities after returning home from the hospital (Gillespie et al., 2023). Effective education not only increases knowledge, but also strengthens patients' self-management capabilities, which is an important component in successful wound healing (Bossert et al., 2023). Effective education not

only provides information but also increases patient participation in decision making related to their recovery process, which ultimately has a positive impact on self-care behavior (Gillespie et al., 2023). Although education is proven to increase mothers' knowledge, its influence on wound condition in the short term may be overshadowed by other clinical factors that also play a significant role.

In this study, the statistical test results showed a significant difference between the level of knowledge and wound condition in the initial phase (pretest), both in the treatment group and the group without treatment. This indicates that at the beginning of care, the mother's knowledge was not fully in line with the wound conditions experienced. This condition can be caused by the limited information received by the mother at the beginning of the postoperative care period, as well as the still high dependence of the mother on health workers.

However, in the final phase (posttest), no significant difference was found between the level of knowledge and wound condition. All respondents showed good wound healing conditions. This finding can be explained by the existence of a relatively uniform and optimal standard procedure for post caesarean section wound care at the health service facilities where the research was conducted. Previous research mentions that standardized post-operative care, including wound care, antibiotic administration, early mobilization, and routine monitoring, can result in uniformly good wound healing outcomes (Gillespie et al., 2023).

The assessment of wound condition in both groups showed that all respondents were in the good/sufficient wound healing category from the beginning to the end of the study. There was no variation in either the pretest or posttest, in both the treatment group and the control group. The Wilcoxon test showed a p value = 1.000 in the posttest wound condition evaluation, which means there was no significant difference between the two groups. The absence of change in wound condition can be explained by several factors, namely that the hospital's standard wound care was already good, so all mothers received uniform care (Demmer, Sorg, Steiert, Hauser, & Tilkorn, 2021). Caesarean section wound healing generally goes well in the first week, so

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variations between respondents are minimal (Tambunan, Ulfah, Marlina, Oktaviani, & Khoerunisa, 2025).

Physiological factors such as nutrition, surgical technique, immunity, and comorbidities have a greater influence on wound healing compared to short-term education (Demmer et al., 2019). The homogeneous wound assessment category makes small changes not appear significant.

Thus, although education is very effective at increasing knowledge, no significant differences in wound condition were seen during the study period. However, education still has important clinical impacts, such as reducing the risk of infection, supporting independent care, and improving early detection of complications. This is in line with research conducted by researchers on wound care management. Research conducted by researchers in the form of case studies related to wound healing showed good wound healing on the seventh day after wound care according to standards influenced by other factors such as education, age, and mobilization (Tambunan, Ulfah, Marlina, Oktaviani, & Khoerunisa, 2025). Apart from educational factors, the wound healing process is also influenced by various other factors such as nutritional status, physical activity, psychological conditions, and family support (Bossert et al., 2022). Therefore, even though education is proven to increase mothers' knowledge, its influence on wound condition in the short term may be overshadowed by other clinical factors that also play a significant role.

Apart from the educational aspect, other factors such as good nutrition, early mobilization, and full clinical support also influence the wound healing process physiologically. National research related to the effect of nutrition fulfillment education shows that nutrition education in post-CS mothers can increase their knowledge about nutritional support that supports the wound healing process (Amelia, 2025). Although no statistical difference in wound condition was found in the posttest phase, the increase in knowledge in the treatment group still has important clinical significance. Good knowledge is the basis for mothers to perform independent wound care after returning home, thereby preventing further complications such as surgical

wound infections (Armyanti, 2024). Adequate education can also increase mothers' self-confidence, reduce anxiety, and increase adherence to care instructions given by health workers.

The nursing implication of this research is the importance of integrating wound care education into post-caesarean section nursing care systematically and sustainably. Nurses have a strategic role in providing comprehensive education, both orally and in writing, so that the information conveyed can be optimally understood and applied by mothers (Gillespie et al., 2023).

Thus, although statistically the wound condition after intervention did not show a difference between groups in the final phase, the increase in respondents' knowledge is an important clinical finding. Good knowledge is the basis for mothers to perform independent wound care after returning home from the hospital, which can help them recognize early complications and encourage correct self-care behavior, as well as support the long-term recovery process. The education provided must consider various delivery methods (verbal, written, audiovisual) in order to reach various patient learning preferences.

CONCLUSION

Wound care education is proven effective in increasing the knowledge level of post caesarean section (CS) mothers. All respondents in the group receiving education showed an increase in knowledge to the good category after the intervention was given. However, no significant difference was found in the wound healing condition between the treatment group and the non-treatment group at the end of the observation, because all respondents were in the good wound healing category. These findings indicate that post caesarean section wound healing is influenced by various factors, including optimal clinical care standards. Nonetheless, increasing knowledge through education has important clinical significance in supporting independent wound care and preventing complications after patients return home.

Wound care education is recommended to be integrated systematically into the nursing care of post caesarean section mothers as part of service standards.

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Further research is recommended to use a larger sample size, longer monitoring duration, and more sensitive wound assessment instruments to evaluate the long-term impact of education on wound healing.

REFERENCES

- Ali, S. Z., Qasem, E. K. A., & Ahmed, S. S. (2023). Effect of Wound Care Guidelines on Women's Knowledge, Beliefs, and Practices Regarding Cesarean Section Wound Healing. *Menoufia Nursing Journal*, 8(2), 49-62.
- Alviana, B., & Imamah, I. N. (2025). Penerapan Film Dressing Terhadap Penyembuhan Luka Post Sectio Caesarea Pada Ibu Nifas di RS PKU Muhammadiyah Karanganyar. Retrieved from: <https://journal.mandiracendikia.com/index.php/JIK-MC/article/view/1848>
- Amelia, F. (2025). Pengaruh Edukasi Pemenuhan Butrisi Terhadap Pengetahuan Ibu Dalam Proses Penyembuhan Luka Post SC di RSIA Muhaya Tahun 2023. Retrieved from: <https://journal.polita.ac.id/index.php/jakayah/article/view/244>
- Andriani, R., Sembiring, I. S., Napitupulu, E., Suhermi, T., & Elnia, E. (2024). Hubungan Pengetahuan Ibu Nifas Tentang Perawatan Luka Post SC Dengan Kejadian Infeksi Luka SC di Desa Multatuli Kec Natal Kab Mandailing Natal Tahun 2023. *Calory Journal Medical Laboratory Journal*, 2(1), 24-30.
- Armayanti, L. Y., Nataningrat, A. A. I., & Tangkas, N. M. K. S. (2024). Hubungan Mobilisasi Dini Terhadap Penyembuhan Luka Sectio Caesarea (SC) Di Ruang Nifas Rumah Sakit Umum Daerah Klungkung. *Jurnal Riset Kesehatan Nasional*, 8(1), 69-74.
- Armyanti, S. (2024). Perbedaan Kemampuan Mobilisasi Dini Menggunakan Broomage Skor Pada Pasien Post Sectio Caesarea Metode Eracs Dan Non Eracs Di Rumah Sakit Amelia Pare (Doctoral Dissertation, Iik Strada Indonesia).
- Bossert, J., Vey, J. A., Piskorski, L., Fleischhauer, T., Awounvo, S., Szecsenyi, J., & Senft, J. (2023). Effect of educational interventions on wound healing in patients with venous leg ulceration: A systematic review and meta-analysis. *International Wound Journal*, 20(5), 1784-1795.
- Demmer, W., Sorg, H., Steiert, A., Hauser, J., & Tilkorn, D. J. (2021). Wound healing and therapy in soft tissue defects of the hand and foot from a surgical point of view. *Medical Sciences*, 9(4), 71.
- Djafar, T., Naziyah, N., Wowor, T. J., & Dwi, L. (2022). The Relationship of Early Mobilization and Wound Healing of Inflammation Phase Among Post Cesarean Section Women at PMI Hospital Bogor West Java. Retrieved from: <https://nhs-journal.com/index.php/nhs/article/view/42>
- Elsayed, A. M., Elsayed Ahmed, N. M., Mohamed, N. S., & Mohamed, H. R. (2021). Effect of Educational Intervention on Women's Knowledge, Practices and Believes Regarding Cesarean Section Wound Care and Healing. *Zagazig Nursing Journal*, 17(2), 116-128.
- Gillespie, B. M., Thalib, L., Harbeck, E., Tobiano, G., Kang, E., Tobiano, S., & Chaboyer, W. (2023). Effectiveness of discharge education for patients undergoing general surgery: A systematic review and meta-analysis. *International Journal of Nursing Studies*, 140, 104471.
- Gillespie, B. M., Walker, R., Lin, F., Roberts, S., Eskes, A., Nieuwenhoven, P., & Chaboyer, W. (2023). Nurse-delivered patient education on postoperative wound care: a prospective study. *Journal of Wound Care*, 32(7), 437-444.
- Saputri, P. D., & Ambarika, R. (2026). Peningkatan Pengetahuan Pasien Post Sectio Caesarea melalui Edukasi Manajemen Kesehatan Pasca

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- Operasi. Kolaborasi: Jurnal Pengabdian Masyarakat, 6(1), 134-142.
- Sulistyaningrum, N. P., Prajayanti, E. D., Prastiwi, Y. I., & Maurytani, A. (2025). The Implementation of Wound Care Education on Post-Cesarean Anxiety in Mothers at Ir. Soekarno Hospital Sukoharjo. *Jurnal Kegawatdaruratan Medis Indonesia*, 4(2), 163-173.
- Tambunan, I., Ulfah, D., Marlina, Y., Oktaviani, R. I., & Khoerunisa, A. (2025). Manajemen perawatan luka pada klien post sectio caesarea di rsud kota bandung. *THE JOURNAL OF Mother and Child Health Concerns*, 4(4), 170-178.
- Ulandari, S., Azizah, E. N., & Wulandari, R. F. (2022). Relationship Between Early Mobilization and The Wound Healing Process of Post Sectio Caesaria in The Maternity Room of RSUD Kabupaten Kediri. *Jurnal Ners dan Kebidanan (Journal of Ners and Midwifery)*, 9(2), 154-161.
- Zarei, M. R., Rostami, F., Bozorghnejad, M., Ardebili, F. M., Mamashli, L., Eliasi, S., & Khachian, A. (2020). Effect of self-care training program on surgical incision wound healing in women undergoing cesarean section: A quasi-experimental study. *Med Surg Nurs J*, 9(4), e108800.

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